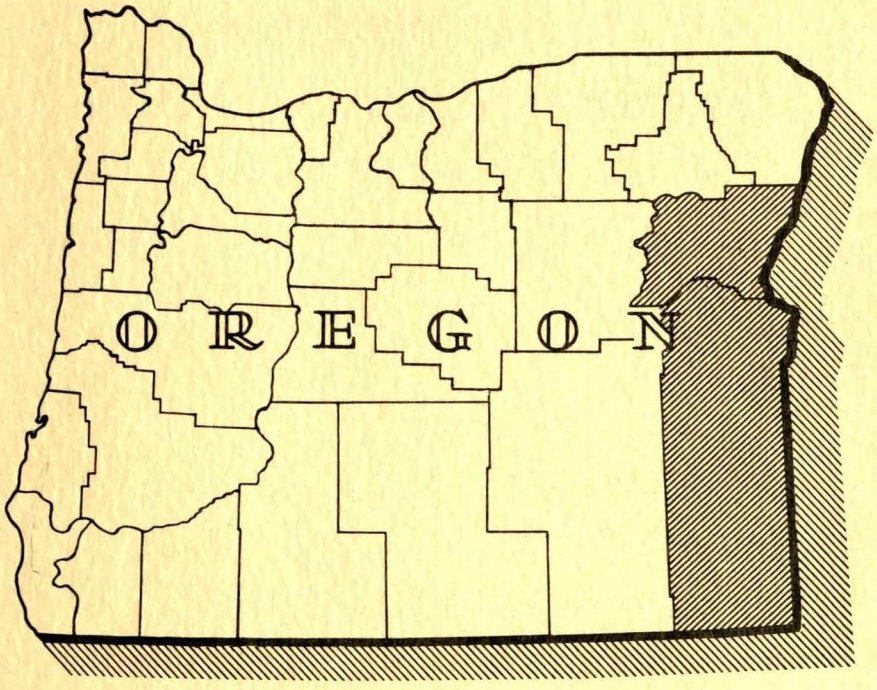
FOREST SURVEY REPORT NO. 132

FOREST STATISTICS *for* BAKER *and* MALHEUR COUNTIES, OREGON



PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
U. S. DEPT. OF AGRICULTURE • FOREST SERVICE

OCTOBER 1958

PREPARED BY

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Forest Survey Report 132

FOREST STATISTICS

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R. W. Cowlin, Director Portland, Oregon

FOREST SERVICE U. S. DEPARTMENT OF AGRICULTURE

PREFACE

This publication summarizes the results of a 1956 reinventory of the forests of Baker and Malheur Counties, Oreg. The reinventory is a part of the maintenance phase of the Forest Survey, a nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928, amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and determine probable future trends in timber requirements, to analyze and make available survey information needed in the formulation of forest policies and programs, and to make resurveys as necessary to keep the basic information up to date.

The Forest Survey is conducted in the various forest regions of the Nation by the regional experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oreg.

The initial inventory of forest lands in Baker and Malheur Counties took place in 1936 and 1937. A statistical report, "Forest Statistics for Baker County, Oregon," and a forest type map on a 1-inch-to-the-mile scale were released in 1937. An office report, "Forest Statistics for Malheur County, Oregon," and a forest type map, on a 1/2-inch-to-the-mile scale, were prepared in 1936.

The forest type maps have been revised, as a result of the 1956 reinventory, and are available on scales of 1 and 2 inches to the mile.[1/]

1/ Prints of the forest type maps are available at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, P. O. Box 4059, Portland 8, Oregon.

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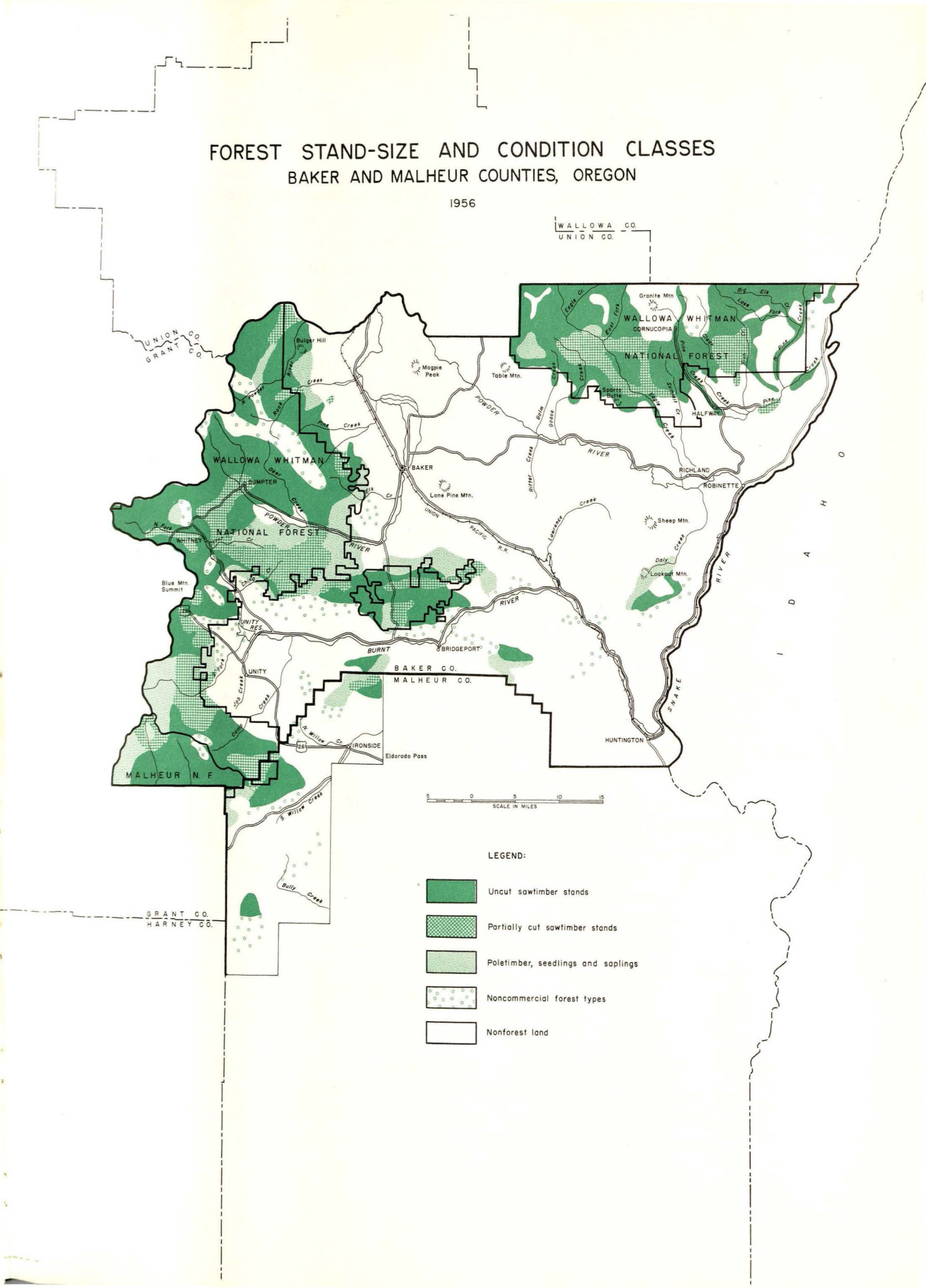
FOREST STAND-SIZE AND CONDITION CLASSES

BAKER AND MALHEUR COUNTIES, OREGON

1956



DESCRIPTION OF THE COUNTIES

Baker and Malheur are adjoining counties in eastern Oregon. Baker County is bounded by Wallowa and Union Counties on the north, Grant County on the west, Malheur County on the south, and the Snake River--the Oregon-Idaho boundary--on the east. Malheur County is bounded by Baker County on the north, Grant and Harney Counties on the west, Nevada on the south, and Idaho on the east.

The streams of both counties drain into the Snake River. The principal streams of Baker County are the Powder and Burnt Rivers, whereas the Owyhee River and its tributaries drain most of Malheur County.

Baker County has varied topography, ranging from the rugged Wallowa and Elkhorn Mountains in the northeastern and middle western parts of the county to the flat rolling bottoms of the Powder River Valley in the southeastern part of the county. Elevations within the county vary from 1,500 feet on the Snake River to 9,097 feet at the summit of Rock Creek Butte. Malheur County is less mountainous and elevations range from 2,200 feet on the Snake River to 7,815 feet at the summit of Ironside Mountain.

The climate of Baker County varies more than that of Malheur County because of greater elevational differences. In 1957, rainfall in Malheur County varied from 8 inches to 16 inches. In Baker County, precipitation ranged from 12 inches in the southern flatlands to more than 46 inches in the mountains.

Both counties have Federal as well as State highways traversing them. Baker County has Federal Highways 30 and 26, and has 300 miles of State highways within its borders. In contrast, Malheur County, with more than three times as much land area, is served by 386 miles of State roads. Malheur County is also traversed by Federal Highways 95, 20, and 26. The main line of the Union Pacific Railroad goes through Baker County; a branch line, the Oregon-Washington Railway and Navigation Co., crosses the northern third of Malheur County.

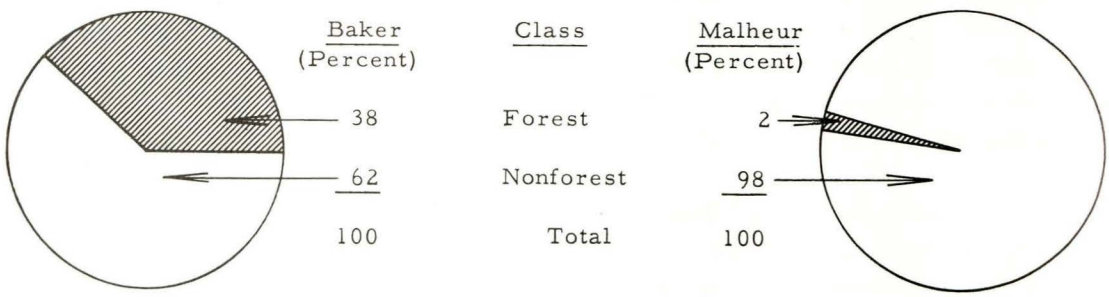
The population of Baker County was estimated at 15,590 in 1955, with 61 percent (9,500) of its people residing in the city of Baker, the county seat. Malheur County had an estimated 23,560 persons, with 4,621 living in its largest city, Ontario.

SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

Land Classification

Baker and Malheur Counties are predominantly agricultural counties, producing livestock, hay, grain, and sugar beets. Commercial forest land comprises a third of Baker County and less than 1 percent of Malheur County.

According to the 1954 Census of Agriculture, 48 percent of Baker County is farmland, which accounts for 77 percent of the total nonforest area. The remaining 23 percent is high-level barrens, townsites, and steep, rocky, nonvegetated areas. In Malheur County, 22 percent of the nonforest land is farmland. Most of the remaining nonforest land is grass and sagebrush rangeland with intermingled barrens.



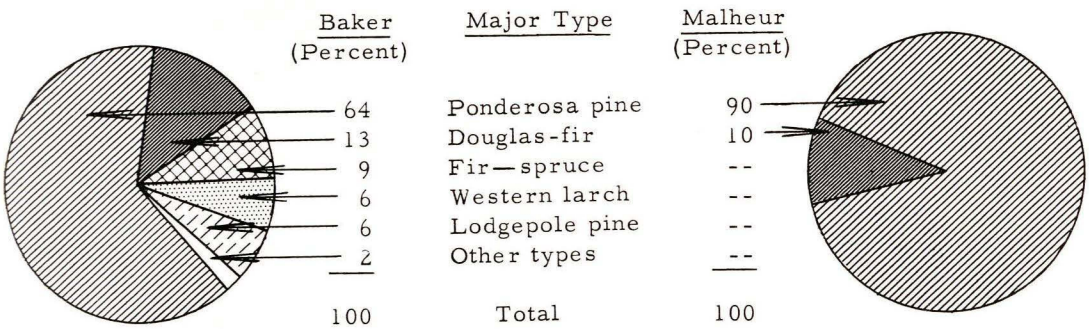
All of the noncommercial forest land in Malheur County is unproductive. Nearly 99 percent is covered with a sparse, bushy growth of western juniper; the remainder consists of noncommercial forest growth on sterile, rocky sites.

About 5 percent of Baker County is classed as noncommercial forest land. Most of it is unproductive and includes the high-elevation subalpine type, a low-elevation juniper belt, and mid-elevation noncommercial rocky areas. The remaining area of noncommercial forest land is in a productive-reserved status and consists of commercial forest land reserved from cutting in the Eagle Cap Wilderness Area and Anthony Lake Limited Area.

Commercial Forest Land Area

Major Types

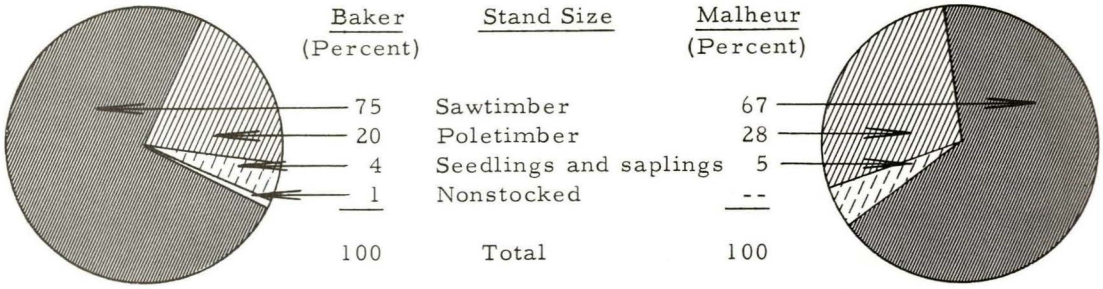
The forests of the two counties are almost exclusively softwoods, with small stringers of hardwoods in the river valleys. A belt of western juniper separates the forest from the grassland. Ponderosa pine predominates over the forested area and often occurs in pure stands at lower elevations.



As elevation increases, other species--of the mixed conifer type--are found in increasing proportions. These associates are Douglas-fir, white fir, western larch, and lodgepole pine. On the cool, moist upper slopes, the mixed types give way to the fir—spruce and whitebark pine types. Extensive pure stands of lodgepole pine are often found at higher elevations where fire, insects, or disease killed the original stand.

Stand-Size Classes

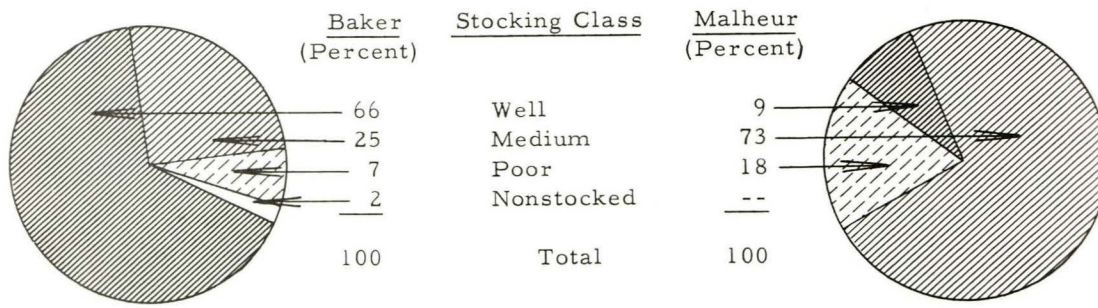
Baker County has 490,000 acres of its commercial forest area in sawtimber stands. Of this area 337,000 acres are occupied by stands classed as large sawtimber (21.0 inches d.b.h. or larger) and 153,000 acres are classed as small sawtimber (11.0— 20.9 inches d.b.h.). There are 131,000 acres of poletimber, most of which has resulted from past cutting. However, a considerable area, especially in the lodgepole pine stands, has developed following fire. Seedling and sapling stands constitute 4 percent of the total commercial forest land of the county. Nonstocked areas, largely resulting from fire, make up less than 1 percent of the total commercial forest area.



Malheur County has 21,000 acres of commercial forest land, of which 67 percent is sawtimber. The remaining 33 percent is in poletimber and seedling and sapling stands.

Stocking of Young-Growth Stands

Most of the young-growth stands of Baker County are satisfactorily stocked (40-100 percent). Only 9 percent of the commercial forest area is poorly stocked or nonstocked. Ninety-seven percent of the young-growth sawtimber, 91 percent of the poletimber, and 84 percent of the seedling and sapling areas are medium or well stocked.



In Malheur County 97 percent of the young-growth sawtimber, 75 percent of the poletimber, but only 30 percent of the seedling and sapling stands are medium or well stocked.

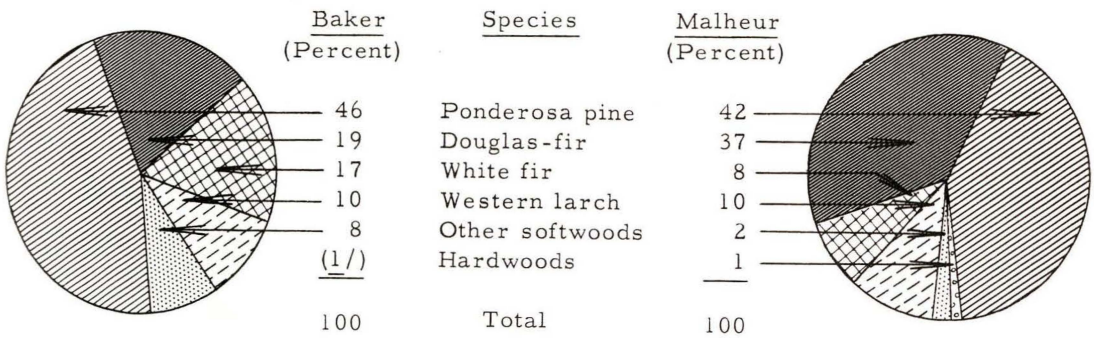
In classifying young-growth stands for stocking, all commercial tree species and tree sizes are considered. A young-growth sawtimber stand may be classed as well stocked on the basis of sawtimber-size trees, poletimber, seedlings and saplings, or any combination of these tree sizes.

Commercial Forest Land Timber Volumes

The net volume of live sawtimber trees (11.0 inches d.b.h. and larger) on commercial forest land in Baker County is estimated to be 6,455 million board-feet, log scale, Scribner rule; in Malheur County, the estimate by Scribner rule is 144 million board-feet. Ninety-eight percent of the total Scribner volume in Baker County and 96 percent in Malheur County are found in sawtimber stands. The remainder of the volume is in sawtimber-size trees in poletimber stands.

Volume of Sawtimber by Species

More than 99 percent of the live sawtimber volume in Baker County is in softwoods. Ponderosa pine accounts for almost half of the total sawtimber volume, and an additional 46 percent is in three other species: Douglas-fir, white fir, and western larch. The remaining 8 percent is distributed among Engelmann spruce, subalpine fir, lodgepole pine, whitebark pine, mountain hemlock, black cottonwood, western juniper, and northwestern paper birch.



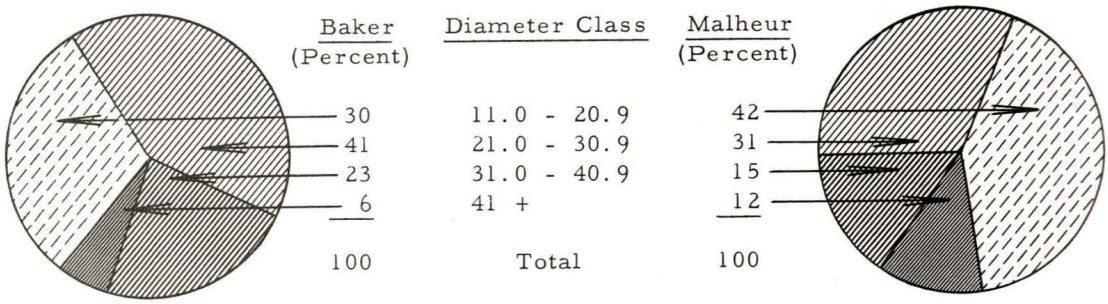
1/ Less than 0.5 percent.

Seventy-nine percent of the live sawtimber volume in Malheur County is ponderosa pine and Douglas-fir. The remaining volume is distributed among white fir, western larch, lodgepole pine, subalpine fir, Engelmann spruce, western juniper, and black cottonwood.

Volume of Sawtimber by Diameter Classes

In Baker County the majority of the sawtimber volume occurs in the 21.0—30.9-inch diameter class. Ponderosa pine occurs as slightly larger trees than the county average, with a distribution in

the four diameter classes of 18, 40, 36, and 6 percent, in order of increasing size.

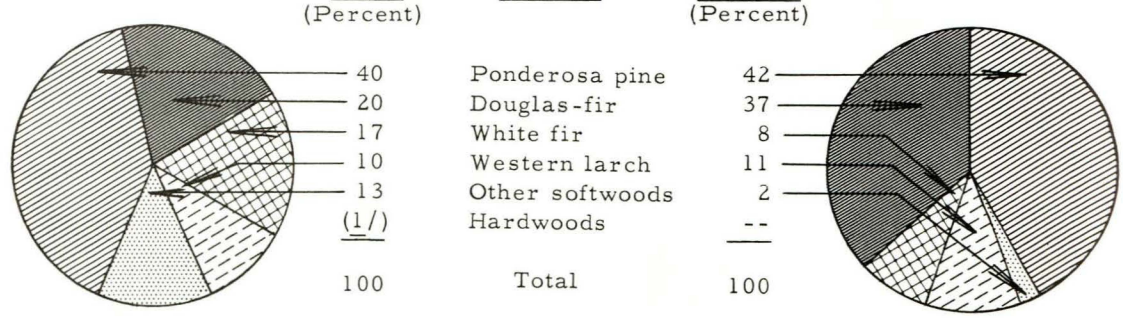


Baker (Percent)	Diameter Class	Malheur (Percent)
30	11.0 - 20.9	42
41	21.0 - 30.9	31
23	31.0 - 40.9	15
6	41 +	12
100	Total	100

In Malheur County the majority of the sawtimber volume occurs in the 11.0—20.9-inch diameter class. Here, ponderosa pine also occurs as slightly larger trees than the county average, with a distribution in diameter classes of 28, 23, 34, and 15 percent.

Volume of Growing Stock by Species

Growing-stock volume includes (1) poletimber-size trees 5.0 to 10.9 inches d.b.h. and (2) sawtimber-size trees 11.0 inches d.b.h. and larger, to a minimum 4-inch top inside bark.



Baker (Percent)	Species	Malheur (Percent)
40	Ponderosa pine	42
20	Douglas-fir	37
17	White fir	8
10	Western larch	11
13	Other softwoods	2
(1/)	Hardwoods	--
100	Total	100

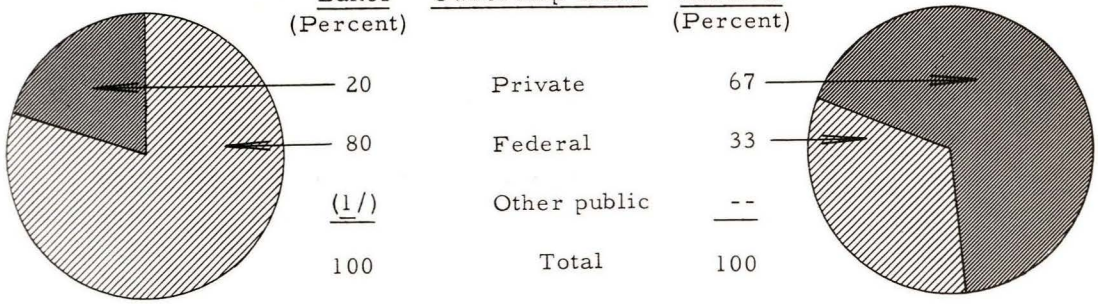
1/ Less than 0.5 percent.

Of the total growing stock in Baker County, 83 percent is in sawtimber trees and 17 percent is in poletimber trees. In Malheur County, 79 percent is in sawtimber and 21 percent is in poletimber.

Forest Ownership

Commercial Forest Land

About 80 percent of the commercial forest area in Baker County is federally owned. Nearly 503,000 of the 521,000 acres is contained in the Malheur and Wallowa-Whitman National Forests. The Bureau of Land Management administers the remaining 18,000 acres. About 20 percent of the total area, or 130,000 acres, is in private ownership, and less than two-tenths of 1 percent (about 1,000 acres) is divided between State, county, and municipal ownerships.

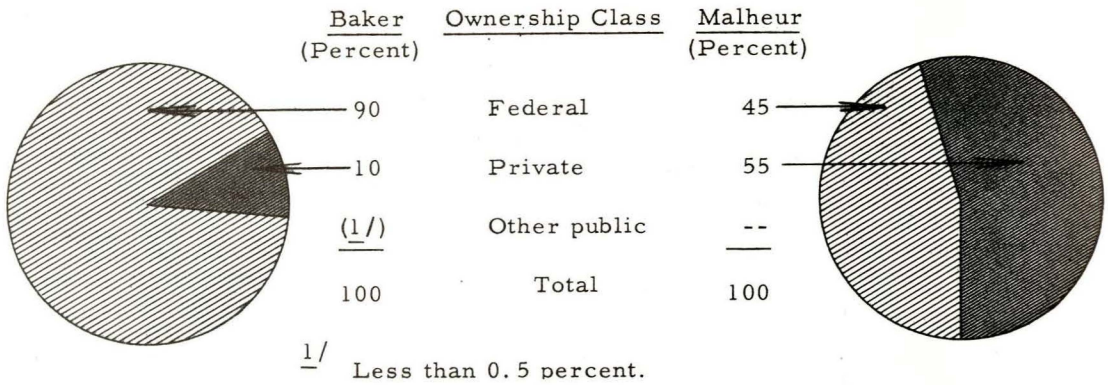


1/ Less than 0.5 percent.

The total commercial forest ownership in Malheur County is split between the Federal and private classes: one-third in Federal and two-thirds in private ownership. Seventy-two percent of the federally owned land is administered by the Bureau of Land Management. The remainder is nearly all in the Wallowa-Whitman National Forests. The Malheur National Forest has 270 acres in Malheur County.

Sawtimber Volume

The major part of the sawtimber volume in Baker County is found on federally owned lands. These contain 90 percent of the total sawtimber volume and comprise 86 percent of the sawtimber area. Private owners have 10 percent of the volume and 13 percent of the sawtimber area. The remainder is on other public lands in State, county, and municipal ownerships.



Of the sawtimber volume in Malheur County, 79 million board-feet is in private ownership and 65 million board-feet is in Federal ownership.

Forest Utilization

Annual log production (thousand board-feet, log scale, Scribner rule) for Baker and Malheur Counties during the period 1950-56 was reported to be:[1/]

Year	National Forests	All other	Total
1950	14,100	440	14,540
1951	22,020	4,900	26,920
1952	7,600	30,360	37,960
1953	21,200	32,290	53,490
1954	36,600	40,084	76,684
1955	45,494	32,100	77,594
1956	51,200	48,178	99,378

National-forest lands furnished 97 percent of the 14 million board-feet of logs cut in the two counties in 1950; they furnished 51 million, or 52 percent of the total, in 1956.

The sharp uptrend in production during recent years is a result of the stepped-up timber-harvesting program on both national-forest and private lands.

1/ Does not include volume removed for poles, piling, or wood-cutting operations.

Table 1.--Land area in Baker County, by major class of land, 1956

Class of land	Area
	Acres
Forest:	
Commercial	651,900
Noncommercial:	
Productive-reserved	4,620
Unproductive	88,110
Total forest	744,630
Nonforest	1,241,320
All classes	1,985,950

Table 2.--Land area in Malheur County, by major class of land, 1956

Class of land	Area
	Acres
Forest:	
Commercial	21,210
Noncommercial:	
Unproductive	73,610
Total forest	94,820
Nonforest	6,221,980
All classes	6,316,800

Table 3.--Area of commercial forest land in Baker County, by ownership and stand-size classes, 1956

(In acres)

Ownership class	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas
Private	129,530	66,100	59,070	3,370	990
State	360	230	110	20	--
County	610	380	230	--	--
Municipal	250	200	50	--	--
Federal:					
Bur. of Land Mgt.	18,650	13,900	4,130	380	240
National Forest	502,500	409,360	67,090	20,930	5,120
Total Federal	521,150	423,260	71,220	21,310	5,360
All ownerships	651,900	490,170	130,680	24,700	6,350

Table 4.--Area of commercial forest land in Malheur County, by ownership and stand-size classes, 1956

(In acres)

Ownership class	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands
Private	13,840	8,760	4,780	300
State	50	10	--	40
Federal:				
Bur. of Land Mgt.	5,280	3,930	920	430
National Forest	2,040	1,990	50	--
Total Federal	7,320	5,920	970	430
All ownerships	21,210	14,690	5,750	770

Table 5.--Area of commercial forest land in Baker County, by major forest type and stand-size class, 1956

(In acres)

Forest type	Total	Sawtimber stands		Pole-timber stands	Seedling & sapling stands	Non-stocked areas
		Large[1/]	Small[2/]			
Ponderosa pine	416,560	245,570	70,640	94,020	6,330	--
Lodgepole pine	39,500	--	5,530	16,580	17,390	--
Douglas-fir	85,720	46,650	25,350	13,100	620	--
Larch	41,810	13,260	25,200	3,100	250	--
Fir-spruce	58,980	31,300	25,060	2,600	20	--
Hardwood	2,980	300	1,310	1,280	90	--
Nonstocked	6,350	--	--	--	--	6,350
Total	651,900	337,080	153,090	130,680	24,700	6,350

[1/] 21 inches d.b.h. and larger.

[2/] 11.0-20.9 inches d.b.h.

Table 6.--Area of commercial forest land in Malheur County, by major forest type and stand-size class, 1956

(In acres)

Forest type	Total	Sawtimber stands		Pole-timber stands	Seedling & sapling stands
		Large[1/]	Small[2/]		
Ponderosa pine	18,900	8,700	4,010	5,460	730
Douglas-fir	2,260	1,280	660	280	40
Larch	40	--	40	--	--
Hardwood	10	--	--	10	--
Total	21,210	9,980	4,710	5,750	770

1/ 21 inches d.b.h. and larger.

2/ 11.0-20.9 inches d.b.h.

Table 7.--Land area in Baker County, by cover

(In

Cover type or land class	Total unreserved and reserved
	PRODUCTIVE
	Total
1 Ponderosa pine, large sawtimber	245,660
2 Ponderosa pine, small sawtimber	70,640
3 Ponderosa pine, poletimber	94,020
4 Ponderosa pine, seedlings and saplings	6,330
5 Lodgepole pine, small sawtimber	6,320
6 Lodgepole pine, poletimber	17,000
7 Lodgepole pine, seedlings and saplings	17,390
8 Douglas-fir, small old-growth and large young-growth sawtimber (red fir)	46,840
9 Douglas-fir, small sawtimber	25,350
10 Douglas-fir, poletimber	13,100
11 Douglas-fir, seedlings and saplings	620
12 Western larch, large sawtimber	13,410
13 Western larch, small sawtimber	25,710
14 Western larch, poletimber	3,100
15 Western larch, seedlings and saplings	250
16 White fir, large sawtimber)	24,560
17 White fir, small sawtimber) 1/	11,830
18 White fir, poletimber)	1,040
19 True fir—mountain hemlock, large sawtimber	2,960
20 True fir—mountain hemlock, small sawtimber	10,740
21 True fir—mountain hemlock, poletimber	1,330
22 Engelmann spruce, large sawtimber	4,400
23 Engelmann spruce, small sawtimber	4,340
24 Engelmann spruce, poletimber	230
25 Engelmann spruce, seedlings and saplings	20
26 Hardwood, large sawtimber	300
27 Hardwood, small sawtimber	1,310
28 Hardwood, poletimber	1,280
29 Hardwood, seedlings and saplings	90
30 Nonstocked area, recently clear cut	20
31 Nonstocked area, old clear cut	660
32 Nonstocked area, deforested by fire	5,670
Total	656,520
	NONCOMMERCIAL
33 Subalpine	15,380
34 Noncommercial, rocky	26,460
35 Juniper	46,270
Total	88,110
	NONFOREST
36 Vegetative land (cultivated, grass or brush)	1,192,420
37 Nonvegetative land (including barrens and cities)	47,390
38 Unmeandered water (reservoirs)	1,510
Total	1,241,320
	ALL
Forest land:	
39 Commercial	651,900
40 Noncommercial (productive-reserved and unproductive)	92,730
41 Total forest land	744,630
42 Nonforest land	1,241,320
Total, all land 3/	1,985,950

1/ See list of tree species, page 42.

2/ Unclassified as to ownership.

type, ownership class, and land-use class, 1956

acres)

Unreserved							Reserved		
					Federal				
Total	Private	State	County	Municipal	Bureau of Land Mgt.	National forest	Total	Federal (national forest)	
FOREST LAND									
Commercial							Noncommercial (productive-reserved)		
245,570	16,700	220	160	150	6,310	222,030	90	90	1
70,640	30,210	10	--	--	2,160	38,260	--	--	2
94,020	45,950	110	100	50	2,290	45,520	--	--	3
6,330	2,520	20	--	--	310	3,480	--	--	4
5,530	60	--	70	--	130	5,270	790	790	5
16,580	1,860	--	--	--	150	14,570	420	420	6
17,390	290	--	--	--	20	17,080	--	--	7
46,650	3,090	--	10	--	1,460	42,090	190	190	8
25,350	7,530	--	--	--	3,060	14,760	--	--	9
13,100	8,610	--	110	--	1,180	3,200	--	--	10
620	290	--	--	--	30	300	--	--	11
13,260	500	--	--	--	--	12,760	150	150	12
25,200	3,060	--	120	--	600	21,420	510	510	13
3,100	1,230	--	--	--	200	1,670	--	--	14
250	200	--	--	--	--	50	--	--	15
24,180	980	--	--	10	100	23,090	380	380	16
11,830	2,470	--	--	--	60	9,300	--	--	17
1,040	370	--	--	--	--	670	--	--	18
2,720	30	--	--	--	--	2,690	240	240	19
9,230	160	--	--	--	20	9,050	1,510	1,510	20
1,330	40	--	20	--	30	1,240	--	--	21
4,400	20	--	--	--	--	4,380	--	--	22
4,000	70	--	--	--	--	3,930	340	340	23
230	10	--	--	--	--	220	--	--	24
20	--	--	--	--	--	20	--	--	25
300	20	--	20	--	--	260	--	--	26
1,310	1,200	--	--	40	--	70	--	--	27
1,280	1,000	--	--	--	280	--	--	--	28
90	70	--	--	--	20	--	--	--	29
20	10	--	--	--	--	10	--	--	30
660	200	--	--	--	140	320	--	--	31
5,670	780	--	--	--	100	4,790	--	--	32
651,900	129,530	360	610	250	18,650	502,500	4,620	4,620	
UNPRODUCTIVE FOREST LAND									
11,510	540	--	--	--	80	10,890	3,870	3,870	33
21,490	1,210	--	--	--	2,720	17,560	4,970	4,970	34
46,270	23,140	650	90	--	15,180	7,210	--	--	35
79,270	24,890	650	90	--	17,980	35,660	8,840	8,840	
LAND									
1,190,810	----------		2/ 1,125,460	----------		65,350	1,610	1,610	36
36,130	11,770	70	40	380	8,240	15,630	11,260	11,260	37
1,400	960	--	--	--	270	170	110	110	38
1,228,340	----------		1,147,190	----------		81,150	12,980	12,980	
LAND									
651,900	129,530	360	610	250	18,650	502,500	--	--	39
79,270	24,890	650	90	--	17,980	35,660	13,460	13,460	40
731,170	154,420	1,010	700	250	36,630	538,160	13,460	13,460	41
1,228,340	----------		1,147,190	----------		81,150	12,980	12,980	42
1,959,510	----------		1,340,200	----------		619,310	26,440	26,440	

3/ Bureau of the Census figure (1950).

Table 8.--Land area in Malheur County, by cover type, ownership class, and land-use class, 1956

(In acres)

Cover type or land class	Total	Unreserved				
		Private	State	Federal: Bureau of Reclamation	Federal: Bureau of Land Mgt.	Federal: National forest
COMMERCIAL PRODUCTIVE FOREST LAND						
Ponderosa pine, large sawtimber	8,700	4,370	--	--	2,460	1,870
Ponderosa pine, small sawtimber	4,010	3,490	10	--	470	40
Ponderosa pine, poletimber	5,460	4,550	--	--	860	50
Ponderosa pine, seedlings and saplings	730	280	40	--	410	--
Douglas-fir, small old-growth and large young-growth sawtimber (red fir)	1,280	360	--	--	840	80
Douglas-fir, small sawtimber	660	520	--	--	140	--
Douglas-fir, poletimber	280	220	--	--	60	--
Douglas-fir, seedlings and saplings	40	20	--	--	20	--
Western larch, small sawtimber	40	20	--	--	20	--
Hardwood, poletimber	10	10	--	--	--	--
Total	21,210	13,840	50	--	5,280	2,040
NONCOMMERCIAL UNPRODUCTIVE FOREST LAND						
Noncommercial, rocky	940	440	--	--	490	10
Juniper	72,670	20,870	1,710	--	49,770	320
Total	73,610	21,310	1,710	--	50,260	330
NONFOREST LAND						
Vegetative land (cultivated, grass or brush)						1,420
Nonvegetative land (barrens and cities)	[6,221,980]			1/ [6,220,560]		--
Unmeandered water (reservoirs)						--
Total	6,221,980	----------	----------	6,220,560	----------	1,420
ALL LAND						
Forest land:						
Commercial	21,210	13,840	50	--	5,280	2,040
Noncommercial (unproductive)	73,610	21,310	1,710	--	50,260	330
Total	94,820	35,150	1,760	--	55,540	2,370
Nonforest land	6,221,980	----------	----------	6,220,560	----------	1,420
Total, all land 2/	6,316,800	----------	----------	6,313,010	----------	3,790

1/ Unclassified as to ownership or type.

2/ Bureau of the Census figure (1950).

Table 9.--Area of commercial forest land in Baker County, by forest-condition and ownership classes, 1956

(In acres)

Forest-condition class	Total	Private	State	County	Municipal	Federal	
						Bureau of Land Mgt.	National forest
Softwoods:							
Large sawtimber:							
Uncut	241,240	12,790	140	160	160	6,660	221,330
Residual	95,540	8,530	80	10	--	1,210	85,710
Total	336,780	21,320	220	170	160	7,870	307,040
Small sawtimber:							
Uncut	87,960	19,850	10	190	--	5,120	62,790
Residual	63,820	23,710	--	--	--	910	39,200
Total	151,780	43,560	10	190	--	6,030	101,990
Poletimber	129,400	58,070	110	230	50	3,850	67,090
Seedlings and saplings	24,610	3,300	20	--	--	360	20,930
Hardwoods	2,980	2,290	--	20	40	300	330
Nonstocked	6,350	990	--	--	--	240	5,120
Total	651,900	129,530	360	610	250	18,650	502,500

Table 10.--Area of commercial forest land in Malheur County, by forest-condition and ownership classes, 1956

(In acres)

Forest-condition class	Total	Private	State	Federal	
				Bureau of Land Mgt.	National forest
Softwoods:					
Large sawtimber:					
Uncut	8,620	3,980	--	3,160	1,480
Residual	1,360	750	--	140	470
Total	9,980	4,730	--	3,300	1,950
Small sawtimber:					
Uncut	1,040	510	10	520	--
Residual	3,670	3,520	--	110	40
Total	4,710	4,030	10	630	40
Poletimber	5,740	4,770	--	920	50
Seedlings and saplings	770	300	40	430	--
Hardwoods	10	10	--	--	--
Total	21,210	13,840	50	5,280	2,040

Table 11.--Area of young-growth timber stands on commercial forest land in Baker County, by stand-size class, species group, and stocking class, 1956

(In acres)

Stand-size class and species group	Total	Well stocked	Medium stocked	Poorly stocked
Young-growth sawtimber:				
Softwoods	151,780	114,320	32,610	4,850
Hardwoods	1,310	780	530	--
Total	153,090	115,100	33,140	4,850
Poletimber:				
Softwoods	129,400	75,810	41,270	12,320
Hardwoods	1,280	710	500	70
Total	130,680	76,520	41,770	12,390
Seedlings & saplings:				
Softwoods	24,610	15,910	4,850	3,850
Hardwoods	90	20	70	--
Total	24,700	15,930	4,920	3,850
All classes:				
Softwoods	305,790	206,040	78,730	21,020
Hardwoods	2,680	1,510	1,100	70
Total	308,470	207,550	79,830	21,090

Table 12.--Area of young-growth timber stands on commercial forest land in Malheur County, by stand-size class, species group, and stocking class, 1956

(In acres)

Stand-size class and species group	Total	Well stocked	Medium stocked	Poorly stocked
Small young-growth sawtimber:[1]				
Softwoods	4,710	860	3,700	150
Hardwoods	--	--	--	--
Total	4,710	860	3,700	150
Poletimber:				
Softwoods	5,740	440	3,860	1,440
Hardwoods	10	10	--	--
Total	5,750	450	3,860	1,440
Seedlings & saplings:				
Softwoods	770	--	230	540
Hardwoods	--	--	--	--
Total	770	--	230	540
All classes:				
Softwoods	11,220	1,300	7,790	2,130
Hardwoods	10	10	--	--
Total	11,230	1,310	7,790	2,130

[1] 11.0-20.9 inches d.b.h.

Table 13.--Net volume of live sawtimber and growing stock on commercial forest land in Baker County, by ownership class, 1956

Ownership class	Live sawtimber volume		Growing stock volume
	Log scale, Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu.ft.
Private	672	743	198
State	2	2	1
County	4	5	1
Municipal	3	3	1
Federal:			
Bur. of Land Mgt.	123	137	34
National Forest	5,651	6,164	1,243
Total Federal	5,774	6,301	1,277
All ownerships	6,455	7,054	1,478

Table 14.--Net volume of live sawtimber and growing stock on commercial forest land in Malheur County, by ownership class, 1956

Ownership class	Live sawtimber volume		Growing stock volume
	Log scale, Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu.ft.
Private	79	87	23
State	(1/)	(1/)	(1/)
Federal:			
Bur. of Land Mgt.	34	38	9
National Forest	31	34	6
Total Federal	65	72	15
All ownerships	144	159	38

1/ Less than 0.5 million.

Table 15.--Net volume of live sawtimber and growing stock on commercial forest land in Baker County, by stand-size class, 1956

Stand-size class	Live sawtimber volume		Growing stock volume
	Log scale, Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu.ft.
Sawtimber stands	6,301	6,878	1,366
Poletimber stands	154	176	111
Seedling & sapling stands	--	--	1
Nonstocked areas	--	--	--
Total	6,455	7,054	1,478

Table 16.--Net volume of live sawtimber and growing stock on commercial forest land in Malheur County, by stand-size class, 1956

Stand-size class	Live sawtimber volume		Growing stock volume
	Log scale, Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu. ft.
Sawtimber stands	138	152	34
Poletimber stands	6	7	4
Seedling & sapling stands	0	0	(1/)
Nonstocked areas	0	0	0
Total	144	159	38

1/ Less than 0.5 million.

Table 17.--Net volume of live sawtimber and growing stock on commercial forest land in Baker County, by species, 1956

Species	Live sawtimber volume		Growing stock volume
	Log scale, Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu.ft.
Softwoods:			
Ponderosa pine	2,965	3,217	589
Western white and whitebark pine	3	4	1
Lodgepole pine	111	129	79
Douglas-fir	1,220	1,348	300
Western larch	671	745	145
White fir	1,071	1,156	252
Subalpine fir	106	115	49
Engelmann spruce	290	320	58
Mountain hemlock	1	1	(1/)
Juniper	1	1	1
Total	6,439	7,036	1,474
Hardwoods:			
Black cottonwood	15	17	4
Other hardwoods	1	1	(1/)
Total	16	18	4
All species	6,455	7,054	1,478

1/ Less than 0.5 million.

Table 18.--Net volume of live sawtimber and growing stock on commercial forest land in Malheur County, by species, 1956

Species	Live sawtimber volume		Growing stock volume
	Log scale Scribner rule	International 1/4-inch rule	
	Million bd.-ft.	Million bd.-ft.	Million cu.ft.
Softwoods:			
Ponderosa pine	60	66	16
Western white pine	--	--	(1/)
Lodgepole pine	(1/)	(1/)	(1/)
Douglas-fir	53	59	14
Western larch	15	17	4
White fir	12	13	3
Subalpine fir	1	1	1
Engelmann spruce	2	2	(1/)
Juniper	(1/)	(1/)	(1/)
Total	143	158	38
Hardwoods:			
Black cottonwood	1	1	(1/)
Total	1	1	(1/)
All species	144	159	38

1/ Less than 0.5 million.

Table 19.--Net volume of live sawtimber on commercial forest land in Baker County, by diameter class and species group, 1956

(In million board-feet)

Diameter class (Inches d.b.h.) and log rule	Total	Ponderosa pine	Douglas-fir	White fir	Other
11.0-20.9:					
Scribner rule	1,934	535	457	346	596
International 1/4-inch rule	2,209	621	530	373	685
21.0-30.9:					
Scribner rule	2,637	1,172	520	519	426
International 1/4-inch rule	2,849	1,266	562	560	461
31.0-40.9:					
Scribner rule	1,506	1,065	167	164	110
International 1/4-inch rule	1,601	1,129	177	177	118
41.0 and larger:					
Scribner rule	378	193	76	42	67
International 1/4-inch rule	395	201	79	46	69
All diameter classes:					
Scribner rule	6,455	2,965	1,220	1,071	1,199
International 1/4-inch rule	7,054	3,217	1,348	1,156	1,333

Table 20.--Net volume of live sawtimber on commercial forest land in Malheur County, by diameter class and species group, 1956

(In million board-feet)

Diameter class (Inches d.b.h.) and log rule	Total	Ponderosa pine	Douglas-fir	Other
11.0-20.9:				
Scribner rule	60	17	25	18
International 1/4-inch rule	69	20	29	20
21.0-30.9:				
Scribner rule	44	14	19	11
International 1/4-inch rule	48	15	21	12
31.0-40.9:				
Scribner rule	22	20	1	1
International 1/4-inch rule	23	21	1	1
41.0 and larger:				
Scribner rule	18	9	8	1
International 1/4-inch rule	19	10	8	1
All diameter classes:				
Scribner rule	144	60	53	31
International 1/4-inch rule	159	66	59	34

Table 21.--Net volume of all timber on commercial forest land in Baker County, by class of material and species group, 1956

(In million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Sawlog portion	1,145	1,142	3
Upper stem portion	86	86	(1/)
Total	1,231	1,228	3
Poletimber trees	247	246	1
Total growing stock	1,478	1,474	4
Other material:			
Sound cull trees	9	9	(1/)
Rotten cull trees	1	1	(1/)
Salvable dead trees	15	15	--
Total other material	25	25	(1/)
All timber	1,503	1,499	4

1/ Less than 0.5 million.

Table 22.--Net volume of all timber on commercial forest land in Malheur County, by class of material and species group, 1956

(In million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Sawlog portion	28	28	--
Upper stem portion	2	2	--
Total	30	30	(1/)
Poletimber trees	8	8	(1/)
Total growing stock	38	38	(1/)
Other material:			
Sound cull trees	1	1	(1/)
Rotten cull trees	(1/)	(1/)	(1/)
Salvable dead trees	(1/)	(1/)	--
Total other material	1	1	(1/)
All timber	39	39	(1/)

1/ Less than 0.5 million.

Table 23.--Average annual cut of live sawtimber and growing stock on commercial forest land in Baker and Malheur Counties, by species group, 1952-56

Species group	Live sawtimber						Growing stock		
	Scribner rule, log scale			International ¼-inch rule					
	Annual cut[1]	Timber products	Logging residue	Annual cut[1]	Timber products	Logging residue	Annual cut[1]	Timber products	Logging residue
	Thousand board-feet						Thousand cubic feet		
Softwoods	364,612	345,506	19,106	397,448	377,568	19,880	68,653	61,286	7,367
Hardwoods[2]	--	--	--	--	--	--	--	--	--
Total	364,612	345,506	19,106	397,448	377,568	19,880	68,653	61,286	7,367

[1] Annual cut is the sum of timber products and logging residue.

[2] Hardwood cut insignificant.

FOREST SURVEY PROCEDURE

Procedures used in the reinventory of Baker and Malheur Counties were materially different from those used in the initial inventory. This change in procedures accounts for some significant differences in the forest-area and timber-volume statistics obtained. Therefore, a brief description of the procedures used in each inventory seems desirable.

Initial Inventory

The initial inventory of the counties' forests was conducted in 1936 and 1937 by what is known as the "compilation method." In this method, existing information on forest types, timber volumes, areas logged, and other inventory data were collected from private timber owners and various public agencies. These data were checked in the field for reliability, and were adjusted to the specifications and standards of Forest Survey. Forest-type and timber-volume data for areas not covered by reliable existing information were obtained through field reconnaissance.

All land in the counties was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial was still further classified by forest type, stand-size or condition class, and--in case of young-growth stands--by stocking and age classes. All such types and classes were mapped in place on a 1-inch-to-the-mile base map of each forested township. These township type maps were then superimposed over current ownership-status plats and dot counted to obtain forest-type area statistics by ownership class. Type delineations on the township maps were traced to a base map of each county to form a county forest type map. The commercial forest land was also classified as to site quality, or forest productive capacity.

In-place, timber-volume estimates were based on existing cruises collected and adjusted to the Forest Survey standard, on field samples, and on ocular appraisals. Cruises made by commercial cruisers were obtained for most of the privately owned timber and Forest Service cruises were available for a large part of the national-forest lands. Separate volume estimates were computed for each of the commercial tree species and for each ownership class. Methods used in this initial inventory did not permit a statistical computation of accuracy of the estimate.

Reinventory

In the reinventory in 1956, the forest type maps of both counties were completely revised. This revision was accomplished through interpretation, classification, and field mapping on aerial photos that covered all of the forest land in the two counties. In the mapping on aerial photos, types whose classification was difficult were examined more closely in the field. Likewise, species composition of mixed stands was checked on the ground. The use of aerial photos in mapping resulted in type delineations of much greater accuracy and detail than were possible through the ground reconnaissance employed in the initial inventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 2-inch county base map through use of a reflecting projector. The type map was then superimposed over a current ownership-status map and a dot count made of forest type areas by ownership class.

Volume estimates for live sawtimber, growing stock, and salvable dead material were calculated by applying average per-acre volumes to the appropriate forest type acreages. The average per-acre volumes for sawtimber stands and poletimber stands were obtained through a sampling procedure in which the stands were measured on randomly selected plots. In the random selection of samples, each individual sawtimber or poletimber stand in the two counties had an equal chance of being selected. A sample consisted of a cluster of 3 fifth-acre circular plots spaced at 6-chain intervals. Intensity of the sampling was designed to produce a total estimate of volume in the counties to a specified sampling accuracy set by Forest Survey.

Average per-acre volumes of sawtimber and poletimber trees in the overstory of seedling and sapling stands and on nonstocked areas were obtained through an aerial-photo plot-sampling procedure. First, 1-acre photo plots were located through random selection. Next, estimates were made of average number of trees per acre, average crown diameter, and average total height for both sawtimber- and poletimber-size trees. Finally, gross volume of the average tree in each class was obtained from volume tables and then adjusted for defect and breakage in order to obtain net volume.

ACCURACY OF 1956 REINVENTORY DATA

Forest Area

In the reinventory of the counties, in-place mapping of the forests and their classification by forest type, stand-size class, and condition class were based on 100-percent coverage. Thus no error due to sampling was involved. Errors due to techniques or judgment in the field and in office computation of data were possible, but difficult to evaluate. Throughout all phases of the work, however, close supervision and frequent checks assured a high level of accuracy and uniformity of standards.

Timber Volume

The chances are 19 out of 20 that the total board-foot volume of live sawtimber, if measured by a 100-percent cruise, would be within plus or minus 6.4 percent of the estimated total of 6,599 million board-feet, log scale, Scribner rule. On the same basis, cubic-foot volume of growing stock from a 100-percent cruise would be within a range of plus or minus 4.7 percent of the estimated 1,516 million cubic feet. Volume estimates by species, stand-size class, or other subdivision probably have greater sampling errors.

DIFFERENCES IN RESULTS OF INVENTORIES

Some of the differences between forest-type and timber-volume statistics resulting from the initial inventory and those from the reinventory are due to actual physical change--such as cutting of stands, restocking of deforested areas, and ingrowth of stands into the next larger size class. Other differences are due to variations in the procedures used to interpret and classify forest conditions, and to variations in standards of utilization. Differences such as these preclude direct comparison of some of the statistics; comparison of other statistics is meaningful only after they have been adjusted to common standards.

Forest Area

In Baker County most of the change has occurred in sawtimber and noncommercial unproductive areas. The sawtimber area has increased 53,000 acres while the noncommercial unproductive area has decreased 50,000 acres. Apparently, most of this change has resulted

from reclassification of upper-slope types formerly considered unmerchantable and consequently classed as noncommercial unproductive. Under present standards of utilization, these types are considered merchantable.

The small decrease in poletimber and seedling and sapling areas between inventories can be accounted for by physical changes, such as the extension of pastures or fields, or by changes in inventory procedure.

Table 24.--Comparison of forest area statistics for Baker and Malheur Counties, initial inventory and reinventory

(Thousand acres)

Forest area	Both counties		Baker		Malheur	
	1936-37	1956	1937	1956	1936	1956
Sawtimber	449	510	442	495	7	15
Poletimber; seedlings & saplings	168	162	167	156	1	6
Nonstocked	4	6	4	6	--	--
Noncommercial unproductive	165	162	138	88	27	74
Total	786	840	751	745	35	95

Malheur County area figures show large increases in all forest area categories but nonstocked area. The differences probably reflect the comprehensiveness of the survey. Malheur County has a small amount of timber scattered over a large area, and with the assistance of aerial photos used in type delineation in the recent reinventory, many small pockets of forest land were included that were smaller than the 40-acre minimum area recognized in the initial inventory.

Timber Volume

The reinventories of both counties showed a greater volume of sawtimber of all species than did the initial inventories. Some of this difference may be due to a favorable growth-drain relationship, where the gain in volume through ingrowth of poletimber trees and growth of sawtimber trees is greater than the loss in volume through cutting or destruction by fire, insects, windthrow, or disease. However, it appears likely that most of the difference is due to changes in standards of utilization and in survey procedures.

The reinventories show a considerably greater volume for all species, but especially so for species other than ponderosa pine. This is due to the fact that much of the high-elevation forest land formerly considered noncommercial has been added to the commercial category. In Baker County, a substantially greater total area of commercial forest land was recognized. In both counties, allowances for defect in minor species have become less because of increased value of these species.

Table 25.--Comparison of timber volume statistics for Baker and Malheur Counties, initial inventory and reinventory

(Million board-feet, log scale, Scribner rule)

Species	Both counties		Baker		Malheur	
	1936-37	1956	1937	1956	1936	1956
Ponderosa pine	2,511	3,025	2,470	2,965	41	60
Douglas-fir	471	1,273	467	1,220	4	53
Western larch	372	686	371	671	1	15
White fir[1/]	222	1,083	222	1,071	(2/)	12
Other softwoods	92	515	92	512	(2/)	3
Hardwoods	2	17	2	16	(2/)	1
Total	3,670	6,599	3,624	6,455	46	144

1/ See list of tree species, page 42.

2/ Negligible amount.

DEFINITION OF TERMS

Land Area

Total Land Area

Includes dry land and unmeandered water surfaces.

Forest Land Area

Includes (a) land that is at least 10-percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; and (b) land from which the trees described in "(a)" have been removed to less than 10-percent stocking and that has not been developed for other use. Minimum area of forest land recognized in reinventory of the counties is 10 acres.

Nonforest Land Area

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the counties is 10 acres.

Forest Land Classes

Commercial Forest Land Area

Forest land that is producing, or is physically capable of producing, usable crops of wood, economically available now or prospectively, and that is not withdrawn from timber utilization.

Noncommercial Forest Land Area

Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but that otherwise qualifies as commercial forest land, and (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Types

Forest Land Types

Forest land is typed on the basis of the predominant species, as indicated by cubic volume for sawtimber and poletimber stands and number of trees for seedling and sapling stands, or on the basis of forest condition, such as nonstocked cutover or burned-over land. Where none of the indicated species comprise 50 percent or more of a given stand, the stand is classified on the basis of plurality of cubic volume or number of trees. In classifying forest land by type, the minimum area recognized is 10 acres.

Commercial Forest Land

Major forest types. Local forest types are grouped into generalized types. The major forest types in Baker and Malheur Counties are as follows:

Ponderosa pine. Forests in which 50 percent or more of the stand is ponderosa pine.

Lodgepole pine. Forests in which 50 percent or more of the stand is lodgepole pine.

Douglas-fir. Forests in which 50 percent or more of the stand is Douglas-fir.

Larch. Forests in which 50 percent or more of the stand is western larch.

Fir—spruce. Forests in which 50 percent or more of the stand is true fir or Engelmann spruce.

Hardwoods. Forests in which 50 percent or more of the stand is black cottonwood or other hardwoods, singly or in combination.

Noncommercial Forest Land

Productive-reserved. Forest land withdrawn from timber utilization through statute, ordinance, or

administrative order, but that otherwise qualifies as commercial forest land.

Unproductive. Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Nonforest Land Types

Vegetative. Cultivated land, stump pasture, grass or brush on nonforest land.

Nonvegetative. Includes barrens and towns.

Unmeandered water. Includes unmeandered streams and lakes, and tideflats.

Tree Classes

Sawtimber Tree

Tree of commercial species, 11.0 inches d.b.h. or larger, that contains at least one 16-foot coniferous saw log or one 8-foot hardwood saw log to a variable top diameter never less than 8 inches inside the bark. Also, 25 percent or more of the gross board-foot volume must be free from rot or defect.

Poletimber Tree

Softwood or hardwood tree 5.0 to 10.9 inches d.b.h. of commercial species in which 25 percent or more of the gross cubic-foot volume is free from rot and defect.

Seedling and Sapling Trees

Live trees of commercial species, less than 5.0 inches d.b.h., and of good form and vigor.

Cull Tree

Live tree of sawtimber or poletimber size that is unmerchantable, now or prospectively, because of defect, rot, or species.

Sound cull tree. Live tree of sawtimber or poletimber size that contains 25 percent or more of sound volume but will not make at least one merchantable log, now or prospectively, because of roughness, poor form, or species.

Rotten cull tree. Live tree of sawtimber or poletimber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing dead or down tree that contains 25 percent or more of sound volume and at least one merchantable 16-foot coniferous or 8-foot hardwood log.

Stand-Size Classes

Sawtimber Stand

Stand of sawtimber trees having a minimum net volume of 1,500 board-feet per acre, log scale, International 1/4-inch rule.

Large sawtimber stand. Stand in which the majority of the volume is in trees 21.0 inches d.b.h. or larger.

Small sawtimber stand. Stand in which the majority of the volume is in trees from 11.0 to 20.9 inches d.b.h.

Uncut Sawtimber Stand

Sawtimber stand that has had not more than 10 percent of its volume removed by cutting.

Residual Sawtimber Stand

Sawtimber stand in which more than 10 percent of the volume has been removed, and in which the residual volume amounts to 1,500 board-feet or more per acre.

Poletimber Stand

Stand failing to meet sawtimber-stand specifications but at least 10-percent stocked with poletimber and larger (5.0 inches d.b.h.

and larger) trees and with at least half the minimum stocking in poletimber trees.

Seedling and Sapling Stand

Stand not qualifying as either a sawtimber or poletimber stand but at least 10-percent stocked with trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial species. "Degree of stocking" is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion or combination of criteria.

Well-stocked stands. Stands that are 70 percent or more stocked with present or potential growing-stock trees.

Medium-stocked stands. Stands that are 40 to 69 percent stocked with present or potential growing-stock trees.

Poorly stocked stands. Stands that are 10 to 39 percent stocked with present or potential growing-stock trees.

Nonstocked areas. Areas less than 10-percent stocked with present or potential growing-stock trees.

Timber Volume

Live Sawtimber Volume

Net volume in board-feet of live sawtimber trees of commercial species:

Scribner rule. The common board-foot rule used in determining log-scale volume of sawtimber in the Pacific Northwest.

International 1/4-inch rule. The standard board-foot rule adopted nationally by the Forest Service in the presentation of Forest Survey volume statistics.

Growing Stock

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

All-Timber Volume

Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

Tree Species

Tree species commonly found in Baker and Malheur Counties include:

Softwoods: Ponderosa pine (Pinus ponderosa)
Lodgepole pine (Pinus contorta)
Douglas-fir (Pseudotsuga menziesii)
White fir (Abies concolor or A. grandis)[2/]
Subalpine fir (Abies lasiocarpa)
Western larch (Larix occidentalis)
Engelmann spruce (Picea engelmannii)
Western juniper (Juniperus occidentalis)
Mountain hemlock (Tsuga mertensiana)
Whitebark pine (Pinus albicaulis)

Hardwoods: Black cottonwood (Populus trichocarpa)
Quaking aspen (Populus tremuloides)
Northwestern paper birch (Betula papyrifera var. subcordata)

2/ No attempt was made to separate A. concolor (white fir) from A. grandis (grand fir). White fir, as specified in the Forest Survey in the Pacific Northwest, may be concolor, grandis, or both.

Timber Cut

Annual Cut of Live Sawtimber

The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from live sawtimber. The volume of timber products cut from live sawtimber.

Logging residues from live sawtimber. The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land and not converted to timber products.

Annual Cut of Growing Stock

The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from growing stock. The volume of timber products cut from growing stock.

Logging residues from growing stock. The net cubic-foot volume of growing stock cut or killed by logging on commercial forest land and not converted to timber products.

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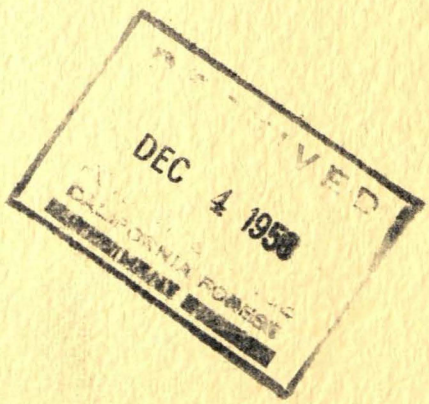
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